

Miller acknowledged to the Society his great obligations to Mr. Dick, a singularly intelligent tradesman of Thurso, to whose geological labours, prosecuted in his leisure hours, Mr. Miller mainly owed his acquaintance with this gigantic Ganoid, and who had kindly made over to him the interesting fossils now before them, illustrative of its form and character.

At the conclusion of Mr. Miller's paper several members spoke of the interesting nature of his researches, and the desirableness of those engaged in the study of palæontology exerting themselves to have in Edinburgh a public collection of fossils, in which our city is so deficient. An interesting discussion also took place, principally bearing on the relation existing between the fossil fauna and flora of ancient epochs and those of the recent æra, when some interesting facts were stated by several members, which it is hoped will be brought forward at a future meeting.

Mr. R. Stark then exhibited to the meeting a few specimens of mosses recently received from North America, and lichens from the Falkland Islands. Among the former were fine specimens of *Bryum roseum*, a large and beautiful species, with mature fruit, *Neckera minor*, Pal. Beauv., and *Anomodon viticulosum*, B. Auct., which is confined to North America. These, and the other species shown, illustrated the modifications produced by the difference of climate and other influences on them, as well as plants of a higher order common to the European and American continent. The lichens from the Falkland Islands, brought home by Dr. J. Hooker, were mostly of species closely allied to or identical with those of Britain. One of the most interesting was a minute species—*Squamaria elegans*—which may be regarded as the most southerly plant known, being found alone on the bleak and desolate southern coast of Cockburn's Island, beyond which all traces of vegetation disappear. Mr. Stark concluded by a few remarks on the desirableness of more fully investigating the geographical range of these plants, with a view of illustrating other branches of natural history.

ZOOLOGICAL SOCIETY.

Feb. 22, 1848.—William Yarrell, Esq., Vice-President, in the Chair.

The following paper was read:—

1. ON A NEW SPECIES OF CHIMPANZEE. BY PROFESSOR OWEN, F.R.S.

This communication contained a description of the skulls of adult and aged male and female Chimpanzees from the Gaboon river, west coast of Africa, much exceeding in size and specifically distinct from the previously known *Troglodytes niger*. The author proposed to call the new species *Troglodytes Savagei*, after Dr. Thos. S. Savage, by whom it had been discovered and its existence made known to Professor Owen, in a letter dated April 24th, 1847, and of which the following extract was read:—

Ann. & Mag. N. Hist. Ser. 2. Vol. iii.

“ Protestant Mission-House,
 Gaboon River, West Africa,
 April 24, 1847.

“ My dear Sir,

“ Your known interest in the Zoology of Africa will find a ready excuse I trust for the following communication, and lead you, in the midst of various engagements, to give me a few moments in reply. I am on my way to the United States in a vessel which, to complete its voyage, had to touch at this point. I find it a region rich and untried in all the departments of Natural History, besides being full of interest in a far more important point of view, that of a missionary field. I have found the existence of an animal of an extraordinary character in this locality, and which I have reason to believe is unknown to the naturalist. As yet I have been unable to obtain more than a part of a skeleton. It belongs to the *Simiadæ*, and is closely allied to the Orangs proper. It reaches nearly if not quite the height of five feet in the adult state and is of a large size. I am considerably in doubt in regard to its identity with an animal said to have been known to Buffon as a large species of orang-outan, under the name of Pongo. It is referred to in a note on the 58th page of the first volume of the American edition of Cuvier's ‘ Règne Animal,’ where he asserts that Pongo is a corruption of Boggo, which is given in Africa to the chimpanzee or to the mandrill, and was applied by Buffon to a pretended large species of orang-outan, the mere imaginary product of his combinations. Then he says that Wurmb, a naturalist of Batavia, transferred the name (Pongo) to a monkey in Borneo, which he thinks identical with *Pithecus Satyrus* (the real orang-outan, a red orang of Asia).

“ My excellent friend, the Rev. J. L. Wilson, missionary of the Am. Bd. of Comm. For. Missions to this part of Africa, thinks that Pongo comes from ‘ Mpongive,’ the name of the tribe, and consequently the region, on the banks of the Gaboon river near its mouth, among which tribe he has resided for about five years. The tribe once extended a great distance on the coast above and below the river Gaboon, and the languages spoken for a great distance both above and below are evidently but dialects, with the Mpongive, of one language. Whence Buffon professed to receive his specimen of ‘ large species of orang-outan ’ I know not; but this region and its vicinity indefinitely are the only points at which, so far as I can ascertain, ‘ a large species of orang-outan ’ has been heard of except the chimpanzee, which is now well-known. I have seen it mentioned that the skeleton of the Pongo of Borneo is in the Royal College of Surgeons, of which Institution you are a Professor. Now may I solicit your aid in this matter? I will send you outlines of the skull of the male and female (adults), and ask the favour of a reply to my letter, stating whether you can identify them with that of any animal you know of under the name of Pongo, or any other cognomen. I have no correspondent in Paris; if you feel sufficient interest in the subject, will you do me the favour to ascertain from that city the fact whether such skulls exist in any cabinet there? The natives state that a young one was caught

many years ago and sold to a French captain who never returned, and that it was the only individual taken out of the river. From what I know, the young skull would very much resemble that of the chimpanzee. I have four crania (two male and two female), with many bones, though not a perfect skeleton; but I hope to complete one before I leave the river, and to procure a dead subject, which I shall preserve in spirits. Great uncertainty however attends my success, as they are indescribably fierce and dangerous, and are found only far in the interior; they are killed by elephant-hunters only in self-defence.

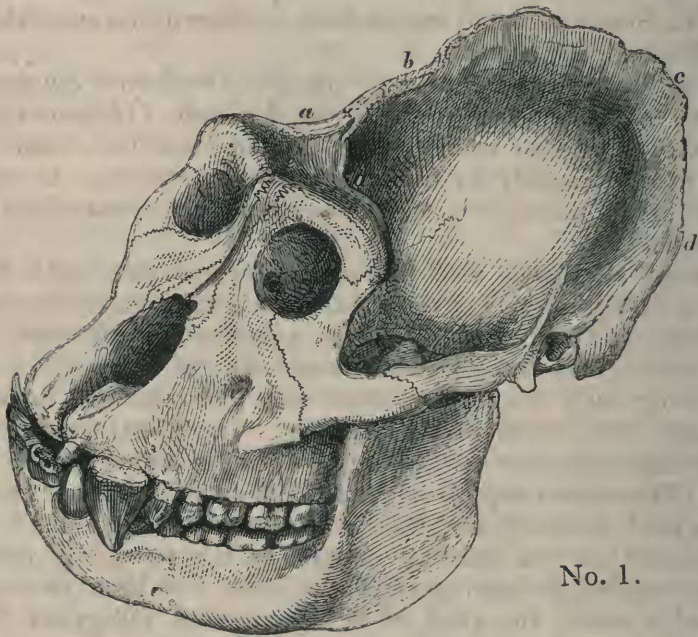
“Below you have a sketch of the cranium of the male (No. 1) and female (No. 2), executed for me by Mrs. Prince, the wife of Dr. Prince, the English Baptist Missionary at Fernando Po, who is here for a short time in search of health. *a, a* are two low ridges converging as seen in the sketch, and uniting at *x*, and forming a strong prominent ridge in the course of the sagittal suture, which comes into a junction with a lateral ridge, *d*, sent back from the petrous portion of such temporal bone; *e* is a strong fossa of triangular shape between the ridges *a, a*. The space between the zygoma and temporal bone in a transverse direction is $1\frac{3}{4}$ inch deep; the diameter from before backwards 3 inches; at *b* is a sinus about half an inch in depth and an inch in length, with foramina for the passage of blood-vessels and nerves. The two upper middle incisor teeth are absent, but their sockets show their size to have been nearly if not quite double the two outer ones. The two lower middle incisor teeth are narrower than the two outer.

“The female cranium is a full-grown one, but differing from the male in the prominence of the ridges, the two anterior corresponding to *a, a* in the male, and the central are rudimental only, except at the extremes of the latter where it joins the posterior transverse ridge, lettered *d* in the male. It has lost the two middle upper incisors, which bear the same relation in respect to size to the two outer that those of the male do. All the incisors both in the upper and lower jaw are larger than they are in the male. The canines in the female are shorter than in the male. These points are all that I need specify to enable you to identify the crania with any in your possession. You will greatly oblige me by a comparison, and communicating the result at your earliest convenience.”

Professor Owen having, at the time when he received this information, observed in the cranium of a young but nearly adult *Troglodytes niger* that the canine teeth presented the same sexual superiority of development* as in the orang's (*Pithecus*), believed it possible that the marks of distinction mentioned by Dr. Savage might prove to be the fully developed characteristics of old and powerful males of the *Troglodytes niger*; and in the absence of means of making comparisons of other characters, besides superior size, longer and larger canine teeth, and concomitant strong sagittal and lambdoidal cristæ, he had deemed it better to communicate

* Odontography, pl. 118, 119, fig. 1.

these doubts to Dr. Savage, than to hazard a premature indication of a species, which might prove a sexual, or a local and stronger, variety of chimpanzee.



No. 1.



No. 2.

Mr. Samuel Stutchbury of Bristol, who had likewise received from Dr. Savage a similar announcement of the existence of a large and formidable species of chimpanzee in the Gaboon district, had requested some of the captains of vessels trading from Bristol to the Gaboon river to make inquiries respecting the species and en-

deavour to obtain specimens of it; and the result was that Captain George Wagstaff had succeeded in procuring at the Gaboon river, and had presented to Mr. Stutchbury, three skulls of the large species and one of the smaller species of chimpanzee, all adult: and these skulls Mr. Stutchbury had transmitted for description and exhibition at the Zoological Society.

One of the skulls of the large species (*Troglodytes Savagei*) was of a very old male: the length of the skull was $11\frac{1}{2}$ inches (0·29), with the molars worn nearly to the stumps, and the crown of the canine reduced, partly by fracture, partly by attrition, to its basal portion: its pulp had been inflamed and had produced ulceration of the alveolus.

A second skull was also of a male, of equal size, with the full dentition of maturity, but with merely the summits of the cusps of the molars and the margins of the incisors slightly worn. The third skull of the *Troglodytes Savagei* was of a female, 9 inches (0·23) long, with the mature dentition, and with the molars not more worn than in the younger male. The fourth skull was of a female adult chimpanzee, $7\frac{1}{4}$ inches (0·185) in length, of the known species (*Troglodytes niger*), with the complete permanent dentition, and the teeth more abraded than in the two preceding skulls.

The lower jaw was wanting in each of the foregoing specimens, and the occipital or basal part of the skull had been more or less fractured in each; the skull of the young but full-grown male of the *Troglodytes Savagei* being the most perfect.

Captain Wagstaff reached Bristol in a broken state of health, and died soon after his arrival. The only information which Mr. Stutchbury was able to obtain from him was, that the natives, when they succeed in killing one of these chimpanzees, make a 'fetish' of the cranium. The specimens bore indications of the sacred marks in broad red stripes crossed by a white stripe, of some pigment which could be washed off. Their superstitious reverence of these hideous remains of their formidable and dreaded enemy adds to the difficulty of obtaining specimens.

Besides the young but mature skull of the male *Troglodytes niger*, of which the permanent dentition was figured in the author's 'Odontography,' he had compared with Mr. Stutchbury's specimens of *Troglodytes Savagei*, a skull of a more aged male *Troglodytes niger* with the permanent dentition more worn than in the younger adult male of the *Troglodytes Savagei*. The results of a detailed comparison between the skulls of the adult males of the two species were then given. Besides the differences of size, as indicated in the subjoined 'Table of Dimensions,' the following were among the characters establishing the specific distinction of the two chimpanzees. With regard to the dentition, the author observed that, as in the smaller species of the Orangs of Borneo (*Pithecus Morio*), the incisive teeth of the smaller species of chimpanzee (*Troglodytes niger*) equalled in size those of the larger species (*Troglodytes Savagei*); but that the canines and the molars were considerably larger in the *Troglodytes Savagei*: the series of the five molar teeth

in this species occupy an extent of 2 inches $7\frac{1}{2}$ lines (0·068), whilst in *Troglodytes niger* their extent is only 1 inch $10\frac{1}{2}$ lines (0·048). The crown of the canine inclines more outwards in *Troglodytes Savagei*; the longitudinal convex ridge on its inner surface is more prominent, the anterior groove bounding that ridge being deeper in *Troglodytes Savagei* than in *Troglodytes niger*: the posterior inner groove is continued upon the root of the tooth in *Troglodytes Savagei*. The last molar is more nearly equal in size to the penultimate one, and is more complex in structure, than in *Troglodytes niger*; it has the posterior outer cusp and particularly the posterior inner cusp more developed, and it has distinctly the connecting cross ridge between the posterior outer and the anterior inner cusp, which ridge is not developed in the last molar of *Troglodytes niger*. The bony palate is longer in proportion to its breadth than in *Troglodytes niger*, in which the breadth of the palate between the canines is absolutely greater than in *Troglodytes Savagei*.

The external sutures between the premaxillary and maxillary bones, which disappear so early in the *Troglodytes niger*, are more or less persistent and traceable in all but the oldest male skull of the *Troglodytes Savagei*; these sutures show that after the premaxillary bone has entered the nose, of which it forms the lateral boundary of the external opening, it again appears upon the exterior surface of the face above the nostril, where its upper extremity forms a triangular or wedge-shaped flattened piece, interposed between the lower half of the *os nasi* and the *os maxillare superius*, thus excluding the latter bone from the boundary of the external nostril. One skull of a young *Troglodytes niger* with deciduous teeth in place, shows by the still persistent upper half of its facial suture, that it terminates in a point a little above the middle of the border of the external nostril, and that a portion of the superior maxillary is interposed between it and the nasal: in two other skulls of young *Troglodytes niger*, the slender pointed summits of the premaxillaries reach the nasals and exclude the maxillaries from the boundary of the nostril, but do not expand into triangular plates as in *Troglodytes Savagei*: in not any of the skulls of *Troglodytes niger* with the permanent dentition does any trace of the suture between the premaxillaries and maxillaries remain*.

The nasal bones of the *Troglodytes Savagei* also afforded a remarkable specific character: although the traces of their primary median division were obvious at their lower part, they had coalesced with each other as in the smaller species; but instead of being flat, or slightly and equably convex on the anterior surface, as in *Troglodytes niger*, they are produced forwards as they incline towards each other, along their upper half, and project there in the form of a slight bony longitudinal ridge, equally dividing the lower half of the interorbital space. This character—the nearest approach

* M. de Blainville, describing the osteology of the chimpanzee from a young specimen of the *Troglodytes niger*, says, "Mais les prémaxillaires, qui offrent la particularité de toucher à peine les os du nez et de sonder de fort bon heure avec les maxillaires," &c. Ostéographie, fasc. i. p. 33.

to the prominent nasal bones of Man made by any known species of ape—is as well-marked in the female *Troglodytes Savagei* as in the male. The lower half of the coalesced nasals in *Troglodytes Savagei* is expanded and nearly flat, of an oval form, with the border forming the upper part of the nostril emarginate on each side of a median, sometimes bifid, point. Thus the lateral border of the nasal bone describes a strong sigmoid curve, convex outwards in its lower two-thirds, in *Troglodytes Savagei*; in the less expanded nasal bone of *Troglodytes niger* the same border is usually concave outwards, or very slightly convex outwards at the lower third; and the outer surface of the bone is flat or equably and very slightly convex. The greater breadth of the lower end of the nasal with the expansion of the upper ends of the premaxillaries, gives a different form to the external nostril in the *Troglodytes Savagei* to that which it presents in *Troglodytes niger*: in this it is ovate or cordate with the narrow end upwards; in the larger species it is a wide ellipsoid, almost as broad above as below.

The alveolar portion of the premaxillaries in *Troglodytes Savagei* was absolutely shorter than in *Troglodytes niger*, and therefore much shorter relatively, and to that extent the skull of the larger species is less 'prognathic.' The zygomatic processes were not only absolutely as well as relatively stronger and deeper than in *Troglodytes niger*, but differently shaped; the squamosal portion rising in an angular form in *Troglodytes Savagei*, and being as deep as the malar portion. The temporal fossæ are relatively as well as absolutely wider; for whilst the zygomatic arches are more expanded, the diameter of the intervening postorbital part of the cranium is the same in the male *Trogl. Savagei* as in the *Trogl. niger*. There is a distinct hemispheric mastoid process in the male *Troglodytes Savagei*. The sphenomaxillary fissure is narrower and less bent in *Troglodytes Savagei* than in *Troglodytes niger*, in which it more nearly resembles that of Man. The supraorbital ridges were even proportionally more developed in the larger than in the smaller species of chimpanzee, and send down a vertical prominence to the root of the nasal bones. The outer and lower borders of the orbits, and the whole malar bones are more prominent and tumid, and, with the enormous sagittal and lambdoidal crests and zygomatic arches, give a scowling and diabolical physiognomy even to dry bones of the head of this most formidable of the great Anthropoid apes.

In the skull of the female of the *Troglodytes Savagei* in which the canine teeth show the same sexual inferiority of size as in the female *Troglodytes niger*, the molar teeth present the same superior degree of development and complexity, especially the last molar, as in the male of the larger species, and have demanded a concomitant increase of bulk of the temporal muscles; and consequently not only are the zygomatic arches relatively stronger, but the temporal ridges, instead of being separated as shown in an aged skull of the female *Troglodytes niger* in the museum of the College of Surgeons, by a smooth tract of more than an inch in breadth, come into contact at the beginning of the sagittal suture, and are so continued backwards with a narrow groove between them, to the lambdoidal crest.

The development of this crest also renders the supraoccipital surface almost flat in the female *Troglodytes Savagei*, and it is even concave in the great males; whilst in both adult males and females of the *Troglodytes niger* it is convex.

There are specific distinctions in the interior of the cranium of the two species: the olfactory (rhinencephalic) fossa closed by the cribriform plate, though very little wider, is considerably deeper in *Troglodytes Savagei* than in *Troglodytes niger*; and the 'crista galli,' which is small in *Troglodytes niger*, is absent in *Troglodytes Savagei*, nor is there any ridge continued from the fossa upon the inner surface of the frontal in the line of the frontal suture.

In *Troglodytes niger* there is a short *ala minor sphenoides* continued outwards from the anterior clinoid process, and the upper and outer angle of the foramen lacerum anterius is produced into a short cleft: in *Troglodytes Savagei* the rudiment of the *ala minor* terminates at the upper border of the foramen lacerum anterius, which has a subquadrate form, and is not extended outwards into an angular fissure. The *sella turcica* is relatively shallower in *Troglodytes Savagei* than in *Troglodytes niger*, in which it is shallower than in Man.

Many other minor differences were noted, but these would be better understood by the aid of the figures in the memoir. Some scepticism, the author observed, might be expected as to the alleged specific distinction of the large and small chimpanzees by naturalists who had not been able to realise the differences by actual comparison of the specimens; but Professor Owen felt no doubt that, as in the case of the *Pithecus Morio*, more extended knowledge of the new species would confirm the validity of its distinction from the *Troglodytes niger*.

The stronger zygomatic arches and the more developed sagittal and lambdoidal crests might be viewed as adaptive developments concomitant on the larger canines, and indicative of a larger and more powerful variety of chimpanzee; but the larger proportional molars and the smaller proportional incisors, the more equal and complex last molar tooth, together with the prominence—slight as it is—of the nasal bones at their median coalescence, their inferior expansion, and, above all, the reappearance of the premaxillaries by their expanded superior extremities upon the face above the nostril, are more than mere differences of size and proportion, and being repeated in both male and female adults of the great chimpanzee of Gaboon, leave no alternative, according to the value assigned to such characters in other Quadrumanous genera, than to pronounce the *Troglodytes Savagei* to be specifically distinct from the *Troglodytes niger*, and this to be, as the *Pithecus Morio* is to the *Pithecus Wurmbii* in Borneo, a smaller, feebler and more anthropoid species of the genus *Troglodytes* in Africa.

In conclusion, Prof. Owen remarked that he had proposed the name of the new species of Chimpanzee provisionally, for the convenience of its description and comparison; and that, should he be able to learn that its discoverer had given a name to it, he should adopt that name, of which *Troglodytes Savagei* would then be a synonym.

	<i>Troglodytes Savagei.</i>		<i>Troglodytes niger.</i>		<i>Simia Wurmbii.</i>	
	Adult Male.	Adult Female.	Adult Female.	Adult Male.	Adult Orang. Female.	Male.
	in. lin.	in. lin.	in. lin.	in. lin.	in. lin.	in. lin.
Length of the head from the <i>inion</i> , or posterior plane of the occiput, to the margin of the incisors	11 4	9 0*	7 6	8 0	8 6	10 6
Length of the head from the <i>inion</i> to the fronto-nasal suture	7 5	6 3	5 2	5 4	5 7	6 3
Length of the head from the fronto-nasal suture to the margin of the incisors ...	5 3	4 4	3 8	3 10	4 4	5 3
Transverse diameter of the <i>cranium</i> at the post-auditory ridges	6 10	5 6	4 9	5 1	4 8	5 8
Length of the smallest lateral diameter of the <i>cranium</i> behind the orbits	2 9	2 5	2 8	2 9	2 6	2 9
Length of the <i>os frontis</i>	4 3	3 7	2 9	2 10	3 0	3 6
Length of the sagittal suture.....	3 9	3 0	2 6	2 8	2 7	3 6
Distance between the temporal ridges.....	nil	nil	1 0	nil	0 6	nil
Diameter of the face at the zygomata	6 9	5 3	4 8	5 0	5 0	6 9
Length of the zygomatic <i>fossa</i>	2 10	2 0	1 9	1 11	2 0	2 6
Breadth of the zygomatic <i>fossa</i>	1 11	1 5	1 1½	1 4	1 5	1 10
Diameter of the face taken from the outside of the middle of the orbits	5 6	4 8	4 3	4 4	3 9	4 8
Interorbital space	1 3	1 1	0 7†	0 10	0 5	0 7
Lateral diameter of the orbit	1 9	1 6	1 4	1 5	1 4	1 6
Perpendicular diameter of the orbit.....	1 7	1 7	1 3	1 3	1 6½	1 7
Transverse diameter of the nasal aperture ..	1 2	1 2	1 0	1 0	1 1	1 0
Perpendicular diameter of the nasal aperture	1 5	1 3	1 1½	1 2	1 6	1 6
Distance between the infraorbital <i>foramina</i>	2 7	2 5	2 1	2 2	1 8	2 0
Breadth of the alveolar portion of the <i>maxilla superior</i>	3 1	2 7	2 4	2 6	2 8	3 2
Distance from the inferior margin of the nasal bone to the inferior margin of the intermaxillary bones.....	2 6	2 3	2 3	2 7	2 7	3 3
Length of the bony palate	4 1	3 4	2 10	3 1	3 3	4 0
Distance from the anterior margin of the intermaxillary bones to the anterior palatal foramen	1 1	0 10	0 10	1 0	1 3	1 3
Antero-posterior extent of the palatal process of the palate bone	1 1	0 7	0 6	0 7	0 8	
Breadth of the crown of the first incisor...	0 6	0 5‡	0 5	0 6	0 5	0 7
Breadth of the crown of the second incisor	0 4½	0 4‡	0 4	0 5	0 3½	0 4
Breadth of the four incisors (upper jaw) ...	1 7	1 6‡	1 6	1 6½	1 6	1 9
Length of the grinding surface of all the <i>molars</i> , the <i>bicuspides</i> included.	2 8	2 7	1 9	1 9½	2 1	2 2
Length of the crown of the canine tooth...	1 4	‡	0 6	0 10	1 2	1 0
Breadth of the enameled crown of the canine tooth	0 10	‡	0 5⅔	0 7	0 6	0 9
Interspace between the canine and incisor teeth, upper jaw.....	0 2	0 1½	0 3	0 4	0 3½	0 3
Distance from the anterior margin of the occipital <i>foramen</i> to the posterior margin of the bony palate	3 0	§	2 4½	2 5	2 9	2 10

* To front border of premaxillaries.

† This varies according to the outswelling of the æthmoidal cells: in one female skull of *Trogl. niger* the interorbital space was an inch across.

‡ Of the alveolus.

§ Base mutilated.

|| Suture obliterated.